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FLOOD INSURANCE STUDY



ORIGINAL

COMPLETED
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VILLAGE OF
WESTHAMPTON BEACH,
NEW YORK
SUFFOLK COUNTY



MAY 19, 1987



Federal Emergency Management Agency

COMMUNITY NUMBER - 365345

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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TABLE OF CONTENTS

	<u>Page</u>
1.0 <u>INTRODUCTION</u>	1
1.1 Purpose of Study	1
1.2 Authority and Acknowledgments	1
1.3 Coordination	1
2.0 <u>AREA STUDIED</u>	2
2.1 Scope of Study	2
2.2 Community Description	2
2.3 Principal Flood Problems	2
2.4 Flood Protection Measures	2
3.0 <u>ENGINEERING METHODS</u>	2
3.1 Hydrologic Analyses	4
3.2 Hydraulic Analyses	4
4.0 <u>FLOOD PLAIN MANAGEMENT APPLICATIONS</u>	10
4.1 Flood Plain Boundaries	11
5.0 <u>INSURANCE APPLICATION</u>	11
6.0 <u>FLOOD INSURANCE RATE MAP</u>	13
7.0 <u>OTHER STUDIES</u>	13

TABLE OF CONTENTS - continued

	<u>Page</u>
8.0 <u>LOCATION OF DATA</u>	14
9.0 <u>BIBLIOGRAPHY AND REFERENCES</u>	14

FIGURES

Figure 1 - Vicinity Map	3
Figure 2 - Transect Location Map	7
Figure 3 - Typical Transect Schematic	9

TABLES

Table 1 - Summary of Elevations	5
Table 2 - Transect Descriptions	6,8
Table 3 - Transect Data	10

EXHIBITS

Exhibit 1 - Flood Insurance Rate Map Index and Street Index Flood Insurance Rate Map	
Exhibit 2 - Elevation Reference Marks	

FLOOD INSURANCE STUDY
VILLAGE OF WESTHAMPTON BEACH, SUFFOLK COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the Village of Westhampton Beach, Suffolk County, New York. This information will be used by the Village of Westhampton Beach to update existing flood plain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and flood plain development.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The wave height analysis in this study represents a revision of the original analysis performed by Dewberry and Davis for the Federal Emergency Management Agency (FEMA). The original work was completed in January 1982. The updated hydrologic analysis was performed by the New York District of the U. S. Army Corps of Engineers (COE); this work was completed in May 1985. The updated wave height analysis was performed by Dewberry and Davis for FEMA, under Contract No. EMW-C-0968; this work was completed in November 1985.

1.3 Coordination

During the progression of the study, contact was maintained between FEMA, the New York State Department of Environmental Conservation, and Dewberry & Davis (the study contractor).

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Westhampton Beach, Suffolk County, New York. The area of study is shown on the Vicinity Map (Figure 1).

Tidal flooding including its wave action for the Atlantic Ocean, Moriches Bay, Moneyboque Bay, and Quantuck Bay was studied by detailed methods. This study was revised to reflect updated storm surge stillwater elevations on these flooding sources. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

2.2 Community Description

The Village of Westhampton Beach is surrounded by the Village of Quogue to the east; the Town Southampton to the east, west, and north; and the Atlantic Ocean to the south. The 1970 population of the village was 1,926; the 1980 population was 1,629; and the 1984 estimated population was 1,700 (References 1 and 2).

2.3 Principal Flood Problems

Since 1938, seven storms that have been classified as severe or unusually severe caused damage in the area. These storms included northeasters that occurred in 1950, 1953, and 1962, and hurricanes that occurred in 1938, 1944, 1954, and 1960. Most of these storms breached the barrier island in a number of locations along Long Island's south shore, frequently forming new inlets into the bays and moving or closing existing inlets. The high ocean water passing through these inlets and over the barrier beach results in rising bay waters with accompanying damage to adjacent property. The dunes along the barrier beach are subject to erosion during these storms.

2.4 Flood Protection Measures

Dune protection measures have been performed on an individual basis to protect the village from tidal surge. There are no other flood protection measures existing or planned within the village.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard



APPROXIMATE SCALE

VICINITY MAP

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF WESTHAMPTON BEACH, NY
(SUFFOLK CO.)

FIGURE 1

data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for each flooding source studied in detail affecting the community.

Stillwater elevations for the Atlantic Ocean, Moriches Bay, Moneybogue Bay, and Quantuck Bay were obtained from the COE report: South Shore of Long Island, New York, Fire Island to Montauk Point (Reference 3).

The stillwater elevation is the elevation of the water due solely to the effects of the astronomical tides, storm surge, and wave setup on the water surface. The inclusion of wave heights, which is the distance from the trough to the crest of the wave, increases the water-surface elevations. The height of a wave is dependent upon wind speed and its duration, depth of water, and length of fetch. The wave crest elevation is the sum of the stillwater elevation and the portion of the wave height above the stillwater elevation.

Wave heights and corresponding wave crest elevations were determined using the National Academy of Sciences (NAS) methodology (Reference 4). The stillwater and maximum wave crest elevations of the selected recurrence intervals are shown in Table 1, "Summary of Elevations."

3.2 Hydraulic Analyses

Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the shorelines.

TABLE 1 - SUMMARY OF ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet)			
	10-YEAR ¹	50-YEAR ¹	100-YEAR ²	500-YEAR ¹
ATLANTIC OCEAN				
The entire shoreline within the community	5.7	8.2	9.4/15	11.8
MORICHES BAY				
The entire southern shoreline within community	5.0	7.0	8.1/11	10.2
The entire northern shoreline within community	5.1	7.5	8.7/11	11.0
MONEYBOGUE BAY				
The entire shoreline within the community	5.1	7.6	8.7/11	10.9
QUANTUCK BAY				
The entire shoreline within the community	5.1	7.3	8.5/11	10.7

¹Stillwater Elevation²Stillwater/Maximum Wave Crest Elevation

Areas of coastline subject to significant wave attack are referred to as coastal high hazard zones. The COE has established the 3-foot breaking wave as the criterion for identifying the limit of coastal high hazard zones (Reference 5). The 3-foot wave has been determined as the minimum size wave capable of causing major damage to conventional wood frame veneer structures.

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in the NAS report (Reference 4). This method is based on three major concepts. First, depth-limited waves in shallow water reach a maximum breaking height that is equal to 0.78 times the stillwater depth, and the wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that the wave height may be diminished by the dissipation of energy due to the presence of obstructions such as sand dunes, dikes, seawalls, buildings, and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is

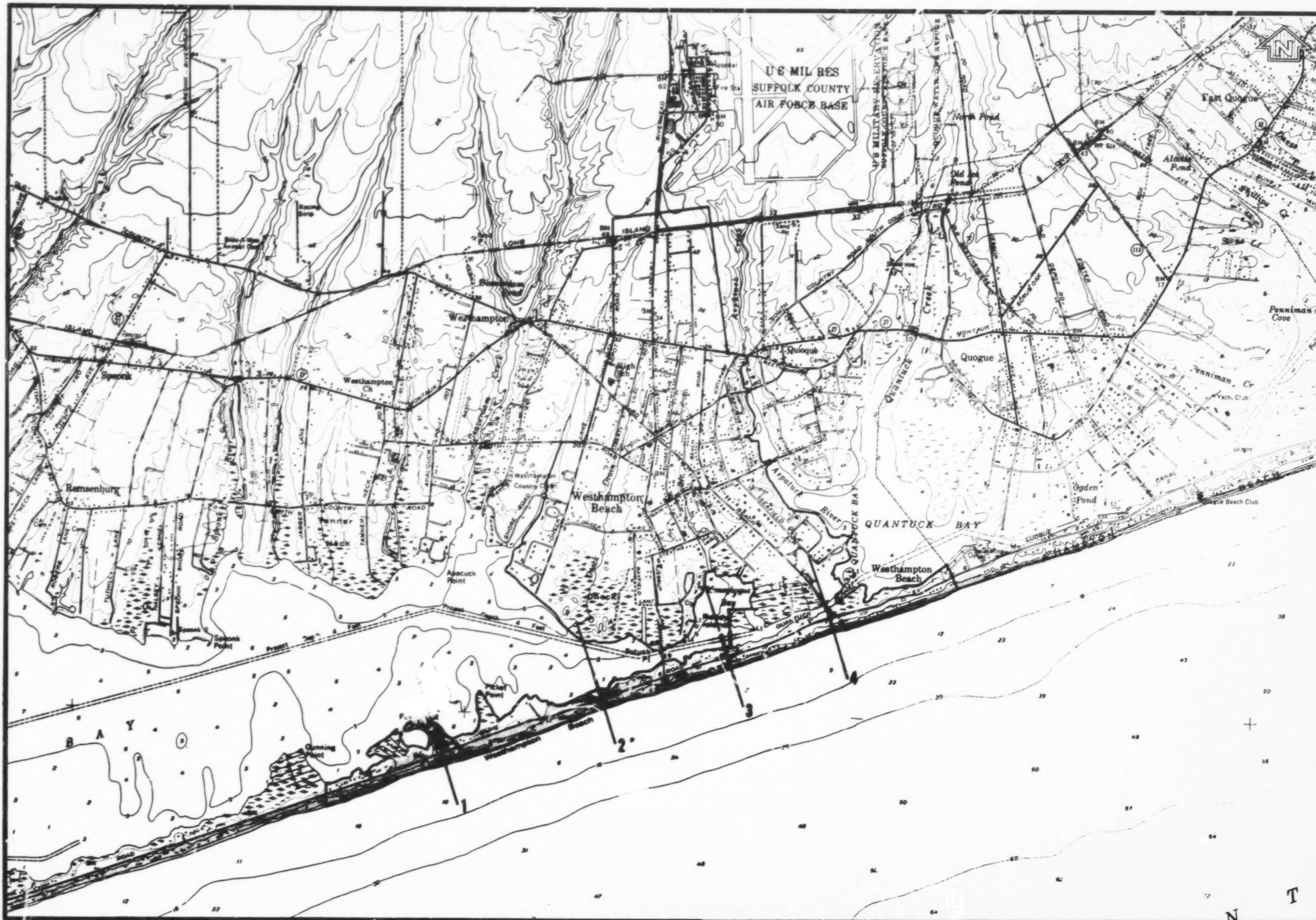
determined by procedures described in Reference 4. The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

These concepts and equations were used to compute wave heights and wave crest elevations associated with the 100-year storm surge. Accurate topographic, land-use, and land-cover data are required for the wave height analysis. Maps of the shoreline areas at a scale of 1:2,400 with a contour interval of 2 feet were used for the topographic data (Reference 6). The land-use and land-cover data were obtained by topographic maps, field surveys, and aerial photographs (References 6 and 7).

Wave heights were computed along transects (cross-section lines) that were located along the coastal areas, as illustrated in Figure 2, in accordance with the User's Manual for Wave Height Analysis (Reference 8). The transects were located with consideration given to the physical and cultural characteristics of the land so that they would closely represent conditions in their locality. Transects were spaced close together in areas of complex topography and dense development. In areas having more uniform characteristics, they were spaced at larger intervals. It was also necessary to locate transects in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects. Table 2, "Transect Descriptions," provides a listing of the transect locations and stillwater elevations, as well as initial wave crest elevations.

TABLE 2 - TRANSECT DESCRIPTIONS

<u>Transect</u>	<u>Location</u>	<u>Elevation (feet)</u>	
		<u>Stillwater</u> <u>100-year</u>	<u>Maximum</u> <u>Wave Crest</u> <u>100-year</u>
No. 1	On the Atlantic Ocean, from the western corporate limits to a point 6,500 feet east of the western corporate limits.	9.4-8.1	15
No. 2	On the Atlantic Ocean, from a point 6,500 feet east of the western corporate limits to Jessup Avenue extended. On Moriches Bay, from the western corporate limits to Jessup Avenue extended.	9.4-8.1	15



APPROXIMATE SCALE

7950 FEET

5300

2650

0

2650

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF WESTHAMPTON BEACH, NY
(SUFFOLK CO.)

FIGURE 2

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TABLE 2 - TRANSECT DESCRIPTIONS - continued

Transect	Location	Elevation (feet)	
		Stillwater 100-year	Maximum Wave Crest 100-year
No. 3	On the Atlantic Ocean, from Jessup Avenue extended to a point 3,500 feet east of Jessup Avenue extended. On Moneyboque Bay, from Jessup Avenue extended to East Division Street extended.	9.4-8.7	15
No. 4	On the Atlantic Ocean, from a point 3,500 feet east of Jessup Avenue extended to the eastern corporate limits. On Moneyboque Bay and Quantuck Bay, from East Division Street extended to Quantuck Canal.	9.4-8.5	15

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and wave crest elevations were computed considering the combined effects of changes in ground elevation, vegetation, and physical features. The 100-year stillwater elevations were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave crest elevations were determined at whole-foot increments along the transect. The location of the 3-foot breaking wave for determining the terminus of the V zone (area with velocity wave action) was also computed at each transect. It was assumed that the beach area would erode during a major storm, thus reducing its effectiveness in decreasing wave heights.

Figure 3 is a profile for a typical transect illustrating the effects of energy dissipation and regeneration on a wave as it moves inland. This figure shows the wave crest elevations being decreased by obstructions, such as buildings, vegetation, and rising ground elevations, and being increased by open, unobstructed wind fetches. Actual conditions in the county may not include all the situations illustrated in Figure 3.

After analyzing wave heights along each transect, wave crest elevations were interpolated between transects. Various source data were used in the interpolation, including the topographic work maps, notes and photographs taken during field inspection, and engineering judgment. Controlling features affecting the wave crest elevations were identified and considered in relation to their positions at a particular transect

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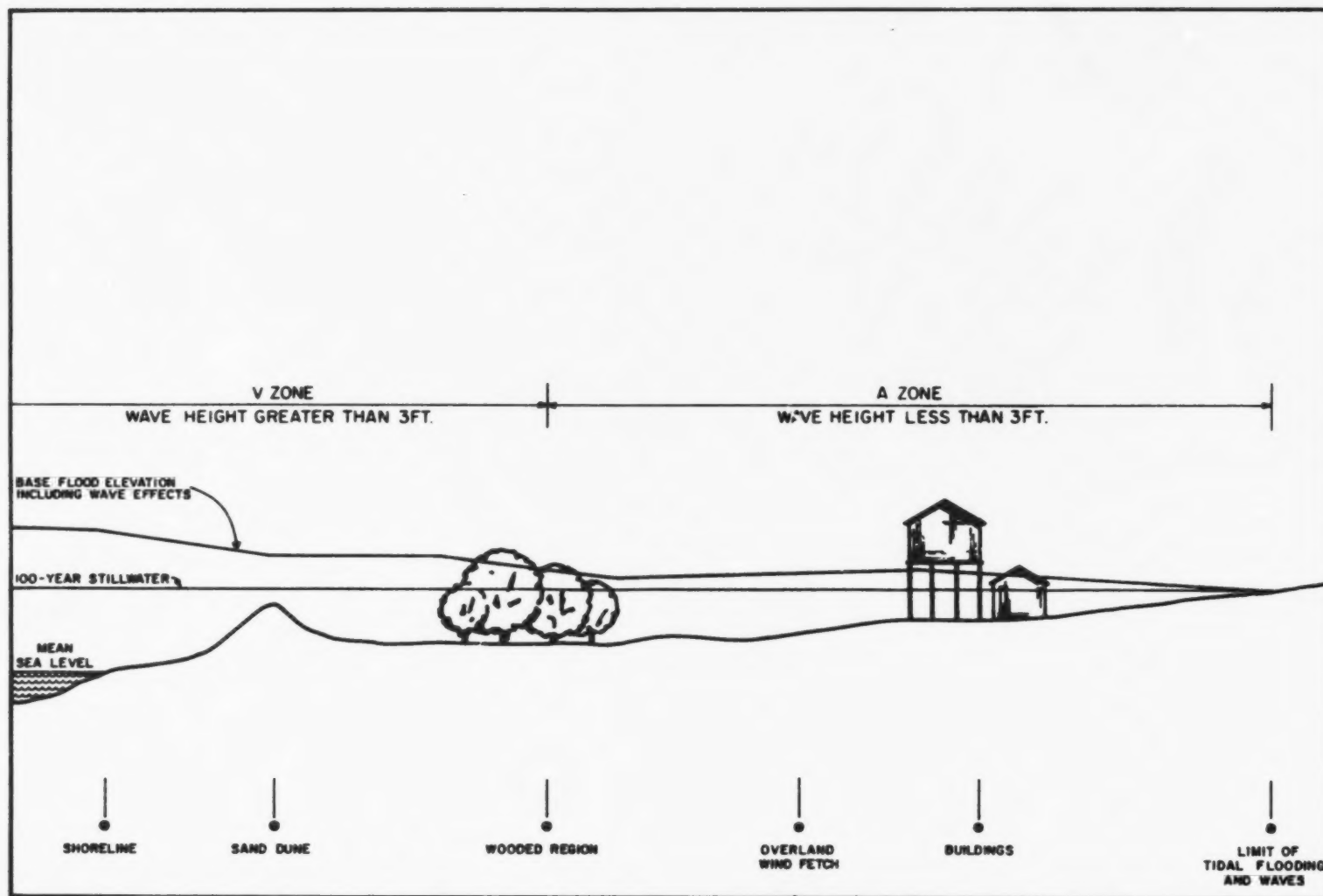


FIGURE 3
TYPICAL TRANSECT SCHEMATIC

9

and their variation between transects. The results of the calculations are accurate until local topography, vegetation, or cultural development within the Village of Westhampton Beach undergo any major changes. The results of this analysis are summarized in Table 3.

TABLE 3 - TRANSECT DATA

<u>Flooding Source</u>	<u>Stillwater Elevation</u>		<u>Base Flood Elevation (Feet NGVD)*</u>
	<u>10-Year</u>	<u>100-Year</u>	
Atlantic Ocean and Moriches Bay			
Transect 1	5.2	9.4	12-15
	5.0	8.1	9-12
Transect 2	5.7	9.4	12-15
	5.0	8.1	9-12
	5.1	8.7	9-12
Atlantic Ocean and Moneybogue Bay			
Transect 3	5.7	9.4	12-15
	5.1	8.7	9-11
Atlantic Ocean and Quantuck Bay			
Transect 4	5.2	9.4	12-15
	5.1	8.5	9-11

*Due to map scale limitations, base flood elevations shown on the FIRM represent average elevations for the zones depicted.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the Flood Insurance Rate Map (Exhibit 1); the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 2).

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year flood plain boundaries and 100-year floodway to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For tidal areas without wave action, the 100-year and 500-year boundaries were delineated using topographic maps at a scale of 1:2,400 with a contour interval of 2 feet (Reference 6). For the tidal areas with wave action, the flood boundaries were delineated using the elevations determined at each transect; between transects, the boundaries were interpolated using engineering judgment, land-cover data, and the topographic maps referenced above. The 100-year flood plain was divided into whole-foot elevation zones based on the average wave envelope elevation in that zone. Where the map scale did not permit these zones to be delineated at one foot intervals, larger increments were used.

The 100- and 500-year flood plain boundaries are shown on the Flood Insurance Rate Map (Exhibit 1). On this map, the 100-year flood plain boundary corresponds to the boundary of the areas of special flood hazards (Zone VE), and the 500-year flood plain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year flood plain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year flood plain, areas within the 500-year flood plain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and flood plain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year flood plains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For flood plain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year flood plains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies for the Town of Southampton and the Village of Quogue are currently being revised (References 9 and 10). The results of those studies will be in exact agreement with the results of this study.

The Long Island Regional Planning Board publication, Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties, New York, was developed to help minimize the loss of life and property due to hurricanes and northeasters in flood prone areas (Reference 11). Although this Flood Insurance Study is based on more recent information, the findings of that study and this study are in accordance with each other.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, New York, Washington, D. C., U. S. Government Printing Office, 1981.
2. Long Island Regional Planning Board, Population Survey 1984, Hauppauge, New York, 1984.
3. U. S. Army Corps of Engineers, New York District, South Shore of Long Island, New York, Fire Island to Montauk Point, New York, New York, May 1985.
4. National Academy of Sciences, Methodology for Calculating Wave Action Effects Associated with Storm Surges, Washington, D. C., 1977.
5. U. S. Army Corps of Engineers, Galveston District, Guidelines for Identifying Coastal High Hazard Zones, Galveston, Texas, June 1975.
6. Topo-Metrics, Inc., of Central Islip, New York, Photogrammetric Survey Map, Scale 1:2,400, Contour Interval 2 Feet: Long Island, New York, June 1980.
7. Aero Graphics Corporation of Bohemia, New York, Aerial Photographs, Scale 1:12,000: Town of East Hampton, New York, March and April 1980.
8. Federal Emergency Management Agency, Federal Insurance Administration, User's Manual for Wave Height Analysis, Washington, D. C., February 1981.
9. Federal Emergency Management Agency, Flood Insurance Study, Town of Southampton, Suffolk County, New York (Unpublished).
10. Federal Emergency Management Agency, Flood Insurance Study, Village of Quogue, Suffolk County, New York (Unpublished).
11. Long Island Regional Planning Board, Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties, New York, Hauppauge, New York, October 1984.

EXHIBIT 2 - ELEVATION REFERENCE MARKS

<u>Reference Mark</u>	<u>FIRM Panel</u>	<u>Elevation (Feet NGVD)</u>	<u>Description of Location</u>
RM 1	03	7.034	USC&GS BM disk stamped G 371 1956 set in top of concrete post projecting 3 inches, 1.4 miles west along Dune Road from junction with Jessup Lane, 21 feet west of fire plug, and 19 feet south of centerline of Dune Road.
RM 2	03	7.014	USC&GS BM disk stamped F 371 1956 set in top of concrete post projecting 4 inches, 0.5 mile west along Dune Road from junction with Jessup Lane, 6.5 feet northeast of fire plug, and 19 feet south of centerline of Dune Road.
RM 3	02	16.995	USC&GS BM disk stamped E 371 1956 set in top of concrete post projecting 3 inches, 0.2 mile south along Potunk Lane from junction with Oak Street, and 18 feet east of centerline of Potunk Lane.
RM 4	02	18.652	USC&GS Tringulation State Disk stamped WHAM 1933 set in concrete sidewalk, at West Bay bridge over Moriches Bay, 131 feet south of north end of bridge, and 78 feet southwest of southwest corner of bridge control tower.

15
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